In the Claims:

1-39. (Canceled)

40. (Currently amended) A method comprising:

a) obtaining a target protein comprising a -SH group, masked -SH group, or activated -SH group;

b) combining said target protein, in aqueous solution, with a library simultaneously containing at least two non-oligomeric ligand candidates wherein said non-oligomeric ligand candidates each comprise a disulfide bond, and wherein said non-oligomeric ligand candidates each are less than about 2000 daltons in size, under disulfide-exchange conditions, in the presence of a reducing agent, wherein at least one non-oligomeric ligand candidate binds to the target protein and forms a disulfide bond with the target protein to yield a target protein-ligand conjugate; and

c) determining the identity of the ~~non-oligomeric~~ ligand present in said target protein-ligand conjugate by subjecting said conjugate directly, without prior fragmentation and without liberation of the ligand from said conjugate, to mass spectrometry analysis.

41. (Previously presented) The method of claim 40 wherein the ligand is less than 1500 daltons.

42. (Canceled)

43. (Previously presented) The method of claim 40 wherein the ligand is less than 750 daltons.

44-46. (Canceled)

47. (Currently amended) The method of claim 40 ~~45 or claim 46~~ wherein the reducing agent is 2-mercaptoethanol.

48-58. (Canceled)

59. (Currently amended) A method for identifying a non-oligomeric ligand that binds to a target protein wherein said ligand less than about ~~750~~ 2000 daltons in size, said method comprising:

a) obtaining said target protein comprising a -SH group, masked -SH group, or activated -SH group;

b) combining said target protein, in aqueous solution, with a library containing at least two non-oligomeric ligand candidates in a mixture wherein said non-oligomeric ligand candidates each comprise a disulfide bond, and wherein said non-oligomeric ligand candidates are each less than about ~~750~~ 2000 daltons in size, under disulfide exchange conditions, in the presence of a reducing agent, wherein at least one non-oligomeric ligand candidate binds to the target protein and forms a covalent disulfide bond with the target protein to yield a covalent target protein-ligand conjugate;

(c) separating the covalent target protein-ligand conjugate from the mixture; and

(d) determining the identity of the ligand present in said conjugate by subjecting said conjugate directly, without prior fragmentation and without liberation of the ligand from said conjugate, to mass spectrometry analysis.

60-63. (Canceled)

64. (Previously presented) The method of claim 40 wherein said -SH group, masked -SH group, or activated -SH group is ~~associated with~~ part of a cysteine residue of said target protein.

65. (New) The method of claim 59 wherein the ligand is less than 1500 daltons.

66. (New) The method of claim 59 wherein the ligand is less than 750 daltons.

67. (New) The method of claim 59 wherein the reducing agent is 2-mercaptoethanol.